Simulation Report

DWSIM v.8.8

Details

Title: MySimulation_41

Comments:

Object: water-in

Type: Material Stream

Property	Value	
Temperature	10	C
Pressure	1	bar
Mass Flow	15000	kg/h
Molar Flow	832.627	kmol/h
Volumetric Flow	15.008	m3/h
Density (Mixture)	999.465	kg/m3
Molecular Weight (Mixture)	18.0153	kg/kmol
Specific Enthalpy (Mixture)	-2502.87	kJ/kg
Specific Entropy (Mixture)	-8.83079	kJ/[kg.K]
Molar Enthalpy (Mixture)	-45090	kJ/kmol
Molar Entropy (Mixture)	-159.089	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.585976	W/[m.K]

Object: methanol-in

Type: Material Stream

Property	Value	
Temperature	80	C
Pressure	5	bar
Mass Flow	25000	kg/h
Molar Flow	780.229	kmol/h
Volumetric Flow	34.0565	m3/h
Density (Mixture)	734.075	kg/m3
Molecular Weight (Mixture)	32.0419	kg/kmol
Specific Enthalpy (Mixture)	-992.148	kJ/kg
Specific Entropy (Mixture)	-3.20424	kJ/[kg.K]
Molar Enthalpy (Mixture)	-31790.3	kJ/kmol
Molar Entropy (Mixture)	-102.67	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.187241	W/[m.K]

Object: water-out

Type: Material Stream

Property	Value	

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Comments:

Temperature	76.2694	C
Pressure	0.998	bar
Mass Flow	15000	kg/h
Molar Flow	832.627	kmol/h
Volumetric Flow	15.4041	m3/h
Density (Mixture)	973.766	kg/m3
Molecular Weight (Mixture)	18.0153	kg/kmol
Specific Enthalpy (Mixture)	-2224.95	kJ/kg
Specific Entropy (Mixture)	-6.33822	kJ/[kg.K]
Molar Enthalpy (Mixture)	-40083.1	kJ/kmol
Molar Entropy (Mixture)	-114.185	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.667115	W/[m.K]

Object: methanol-out

Type: Material Stream

Property	Value	
Temperature	31.9924	C
Pressure	4.975	bar
Mass Flow	25000	kg/h
Molar Flow	780.229	kmol/h
Volumetric Flow	31.9524	m3/h
Density (Mixture)	782.414	kg/m3
Molecular Weight (Mixture)	32.0419	kg/kmol
Specific Enthalpy (Mixture)	-1158.9	kJ/kg
Specific Entropy (Mixture)	-4.21042	kJ/[kg.K]
Molar Enthalpy (Mixture)	-37133.3	kJ/kmol
Molar Entropy (Mixture)	-134.91	kJ/[kmol.K]
Thermal Conductivity (Mixture)	0.200126	W/[m.K]

Object: HX-1

Type: Heat Exchanger

Property	Value	
Global Heat Transfer Coefficient (U)	450	W/[m2.K]
Heat Exchange Area (A)	250	m2
Heat Load	1158	kW
Cold fluid outlet temperature	76.2694	C
Hot fluid outlet temperature	31.9924	C

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Details

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Comments:

[Shell and Tube] Internal Shell Diameter	500	mm
[Shell and Tube] Shell Fouling Factor	0	K.m2/W
[Shell and Tube] Baffle Cut	20	%
[Shell and Tube] Shells in Series	1	
[Shell and Tube] Baffle Spacing	250	mm
[Shell and Tube] Internal Tube Diameter	50	mm
[Shell and Tube] External Tube Diameter	60	mm
[Shell and Tube] Tube Length	5	m
[Shell and Tube] Tube Fouling factor	0	K.m2/W
[Shell and Tube] Tube Passes Per Shell	2	
[Shell and Tube] Number of Tubes	50	
[Shell and Tube] Tube Pitch	70	mm
[Shell and Tube] Fouling Factor (Design)	0	K.m2/W
[Shell and Tube] LMTD Correction Factor (F)	1	
Logarithmic mean temperature difference LMTD	10.2934	C.
[Shell and Tube] Resistance heat transfer pipes	0	K.m2/W
[Shell and Tube] Resistance thermal conductivity pipes	0	K.m2/W
[Shell and Tube] Resistance heat transfer shell	0	K.m2/W
[Shell and Tube] Reynolds number shell	0	
[Shell and Tube] Reynolds number tubes	0	
Thermal Efficiency	94.5073	%
Maximum Theoretical Heat Exchange	1225.31	kW
Minimum Temperature Difference	0	C.
Heat Loss	0	kW
User-Defined LMTD Correction Factor	1	
Outlet Vapor Fraction (Stream 1)	0	
Outlet Vapor Fraction (Stream 2)	0	
Pressure Drop (Cold Side)	0.002	bar
Pressure Drop (Hot Side)	0.025	bar